Tri-State Traveler Information Integrated Corridor Management System:
A Project Concept Using ITS Architectures

Sponsored by the
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1. Project Overview

Local and state agencies need an integrated information management scheme to help address the region's transportation challenges brought on by long-distances and seasonally unpredictable weather. Presently, ITS field devices have been deployed and will be expanded along major highways in the region to enhance traffic monitoring, road condition detection, and en-route traveler information. Transportation management agencies and emergency response agencies in different districts and states, however, do not have a communication system that efficiently shares the information from the field devices.

Built upon existing ITS infrastructure and programmed projects, the *Tri-State Traveler Information Integrated Corridor Management System* **promotes multi-jurisdictional transportation data sharing and information integration**. Integrating information among the traffic management centers in the region will keep neighboring jurisdictions aware of changes in road conditions in the entire region. Freight operators will be informed about weather restrictions, and drivers can obtain road closure and incident information early enough to make itinerary changes or other driving decisions.

The project is also an opportunity to examine a broader-based ITS system, which can be applied to the statewide I-5 corridor and other critical routes, to demonstrate ITS capabilities for corridor management. The *Tri-State Traveler Information Integrated Corridor Management System* is consistent with the following proposed ITS projects in SWITSA:

- Interregional traffic management coordination strategies and procedures
- Dissemination of real-time CVO-tailored information

The benefit of the *Tri-State Traveler Information Integrated Corridor Management System* will be reflected in the following aspects:

Economic Benefits – Improved traffic management information exchange and traveler information will reduce delay which will enhance freight transportation efficiency and traveler convenience.

Safety Benefit – Improved center-to-center communication will reduce incident response time, alert travelers of potentially dangerous driving conditions and closures, and reduce travelers' and vehicles' involvement in accidents and risk of being stranded in adverse weather.

Traffic Management – Interagency traffic management will be enhanced from manual, phone-based information exchange to high-speed, automated data transmission, which will significantly improve the capacity and efficiency of traffic management in the region.

Traveler Information – Improved interagency coordination and information sharing will ensure that traveler information dissemination to cross-boundary travelers is comprehensive, consistent, and timely so that they can make route and itinerary decisions in advance.

1.2 Project Background

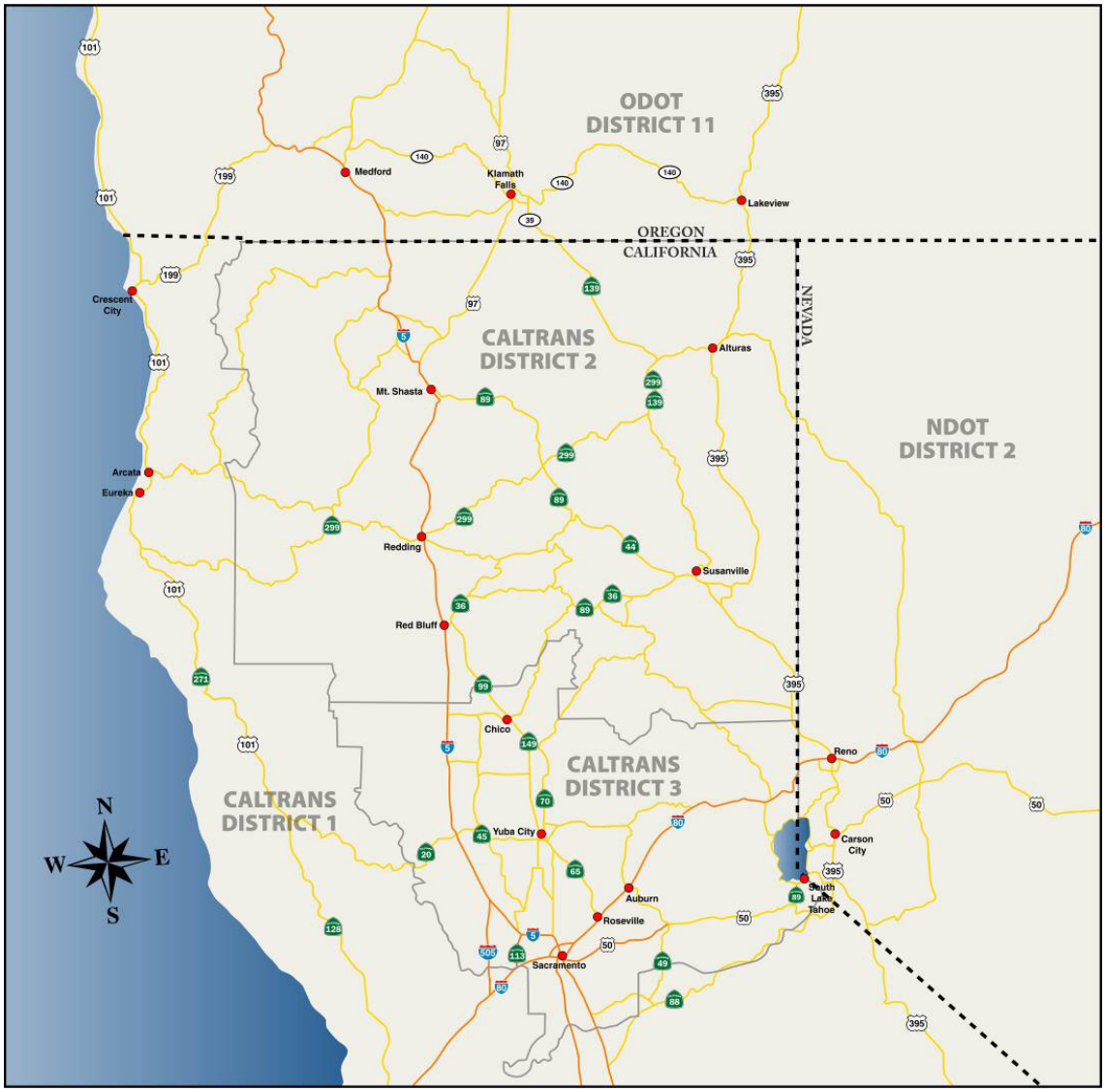


Figure 1: Study Area

The **project study area** (Figure 1) covered by *Tri-State Traveler Information Integrated Corridor Management System* includes Caltrans Districts 2 and 3 in northern California, a portion of ODOT District 11 in southern Oregon, and part of NDOT District 2 in northwestern Nevada. The project region expands over 55,000 square miles, 28 counties, and is covered by over 3,000 miles of interstate and state highways. The study area is characterized by rural and mountainous land covered by a relatively sparse interstate and state highway network. A considerable part of the interstate and state highways are located in mountainous areas with potentially high accident rates, difficult accident clearance conditions, and long response times. This situation is exacerbated during the winter season, when wind and snow often cause extended highway closures and quickly changing travel conditions.

Located in the heart of the West Coast's key freight transportation corridor, the study area is critical to North America's goods movement; the traffic volume in this area continues to increase. The highways in the study area connect metropolitan areas such as San Francisco and Sacramento to famous resort areas such as Lake Tahoe, Lake Shasta and many of the national parks in the western states. The cities in the study area are popular tourist destinations and attractive residential areas due to its beautiful natural environment and quiet lifestyle in contrast to other California cities.

Counties and major cities in each jurisdiction are listed in **Addendum 1**.

1.3 Stakeholder Involvement

The primary stakeholders for the *Tri-State Traveler Information Integrated Corridor Management System* were identified by research of existing planning documents, phone interviews, document/data submissions, and multiple stakeholder workshops, as well as the project team's experience with state, regional, and local agencies.

The primary stakeholders identified for this project are summarized in **Addendum 2.**

2. EXISTING, PLANNED, AND PROGRAMMED ITS SYSTEMS

This section describes existing, planned, and programmed systems and the services in the region that focus on traffic management, traveler information, incident information management, and goods movement.

Various ITS projects, such as Advanced Traffic Management Systems (ATMS) and Advanced Traveler Information Systems (ATIS), have been implemented for years in the Tri-State region and more ITS devices have been planned or programmed to enhance the existing services. Existing, planned, and programmed ITS will provide services with the potential to be integrated into a sustainable Tri-State region service system. This is a new and higher level goal offered by *Tri-State Traveler Information Integrated Corridor Management System .*

2.1 Existing Traffic Management Centers

There are four major traffic management centers (TMC) in the Tri-State region as listed in **Table 2.1**. Their daily operations include monitoring traffic and roadway conditions, dispatching maintenance teams to restore road services after incidents or severe weather conditions, and disseminating traveler information through various media. They can share information and coordinate with other traffic management centers under necessary circumstances.

Table 2.1 Major Traffic Management Centers

	Center	Location	Service Area	Operating Schedule	Collocated with Emergency Response Agency
1	Redding Transportation Management Center (**Redding TMC**)	Redding, CA	Caltrans District 2	8 AM – 5 PM Mon – Fri (Extra operation time during severe weather or incidents)	No
2	Sacramento Transportation Management Center (**Sacramento TMC**)	Sacramento, CA (Satellite office in Kingvale, CA operates in winter)	Caltrans District 3	24 * 7	Yes
3	Medford Transportation Operation Center (**Medford TOC**)	Medford, OR	Southern Oregon	24 * 7	Yes
4	Northern Nevada Road Operations Center (**Reno TMC**)	Reno, NV	Northwestern Nevada	24 * 7	No

2.2 Existing and Programmed Internet Traveler Information

Traveler information websites provide different categories of information for different areas. The information categories available from these websites are shown in **Table 2.2,** and the geographical coverage of the information is shown in **Table 2.3**. Except for the Caltrans Traveler Information Map Implementation (TIMI) which has been programmed and currently is under development, the other internet traveler information services are existing and available. More detailed descriptions of each traveler information website are followed.

Table 2.2: Internet Traveler Information Categories

Website	URL	CCTV Camera Images[1]	Weather Info	Chain Control	Other Traveler Information[2]
ODOT Trip Check	www.TripCheck.com	X	X	X	X
NDOT Traveler Information	www.nvroads.com		X	X	X
Caltrans District 2	www.dot.ca.gov/dist2	X	X	X	X
Caltrans District 3	www.dot.ca.gov/dist3	X		X	X

Website	URL	CCTV Camera Images[1]	Weather Info	Chain Control	Other Traveler Information[2]
California Redding Area WeatherShare	http://weathershare.org/svgmap.php		X		
Caltrans Traveler Information Map Implementation (TIMI)	To be determined	X	X	X	X
Sacramento Region Travel Info	www.sacregion511.org	X	X	X	X

1. The images are transmitted to TMCs via streamlining but published on the internet as still JPEG pictures captured every hour.
2. Other traveler information includes real-time traffic conditions, road constructions/closures, incidents, vehicle restrictions, and special events.

Table 2.3: Internet Traveler Information Coverage Area

Website[3]	Oregon	Caltrans District 2	Caltrans District 3	Nevada
ODOT Trip Check	■	■		
NDOT Traveler Information			■	■
Caltrans District 2	■	■		
Caltrans District 3			■	
California Redding Area WeatherShare		■	■	
Caltrans Traveler Information Map Implementation (TIMI)	■	■	■	■
Sacramento Region Travel Info			■	

3. Partial coverage for some areas is indicated by half highlight.

2.2.1. ODOT Trip Check

Trip Check is owned, operated, and maintained by ODOT. Trip Check provides traveler information for all major interstates and state highways in Oregon, including real-time CCTV camera images, road surface condition, temperature, precipitation, automated road weather station data, chain regulations, and construction/road closure information.

In addition to Oregon information, users can also find real-time CCTV camera images for portions of I-5 and US-97 that close to the Oregon border in California. These image files are retrieved by ODOT from an FTP site set up by the Caltrans District 2 Redding TMC. Users

can also find links to traveler information websites for neighboring states from Trip Check. Figure 2.1 shows how Trip Check displays camera images of some California highways.

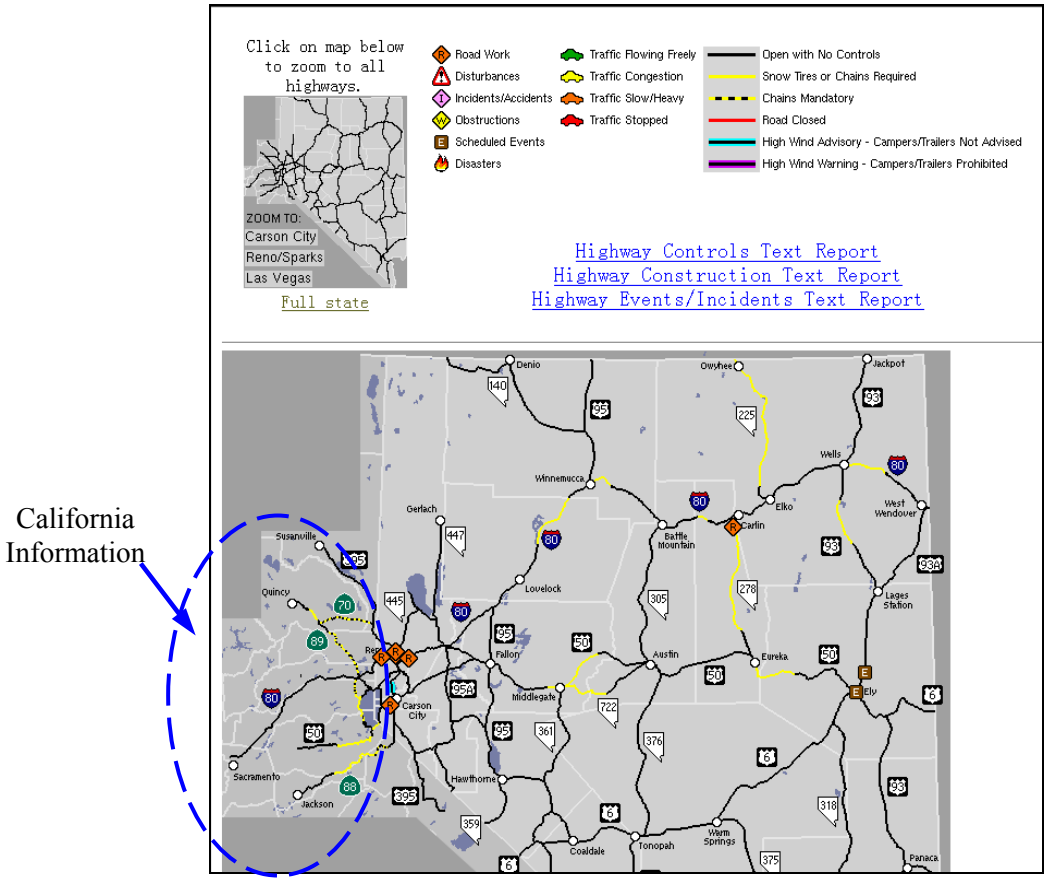
Figure 2.1: Oregon Trip Check Website Showing California Information

Pop-up Window

2.2.2 NDOT Traveler Information

NDOT provides data and has its vendor (Meridian) create and update the website to provide traveler information to the public. The website provides real-time road conditions, weather conditions, and incident and event information, in addition to traffic flow condition and traction device regulation information. As displayed in **Figure 2.2**, the NDOT Traveler Information website provides chain control information for the part of California that borders Nevada.

Figure 2.2: NDOT Traveler Information Website Showing California Information



California Information

2.4.1 Major Goods Movement Corridors

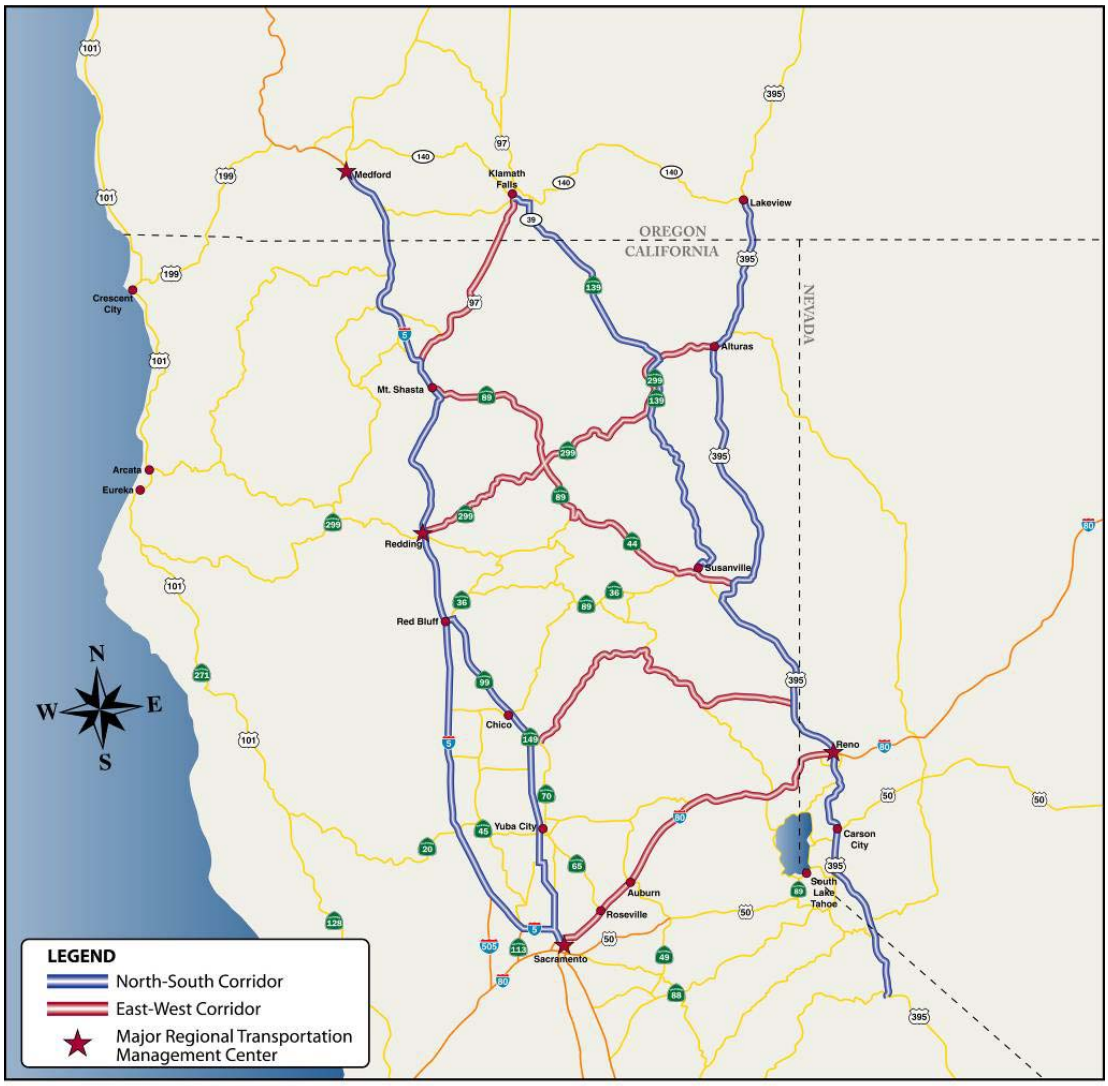
The major goods movement corridors are illustrated in the **Figure 2.3**. The major north-south corridors include

1. Interstate 5 (I-5) that links California and Oregon
2. SR-139/SR-39 (SR-139 becomes SR-39 in Oregon) that links California and Oregon,
3. US-395 that links Nevada, California, and Oregon, and
4. SR-99 that links Caltrans District 2 and District 3.

The five major north-south corridors are connected by several other generally east-west corridors:

1. US-97 that links I-5 and SR-139/SR-39
2. SR-299 that links I-5, SR139/SR-39, and US-395
3. SR-89 and SR-44 that links I-5, SR139/SR-39, and US-395
4. SR-70 that links SR-99 and US-395
5. I-80 that links I-5 and US-395

Figure 2.3: Major Regional Goods Movement Corridors



3. REGIONAL ITS NEEDS

Common geographical features, similar climate conditions, and interconnected highway network in northern California, southern Oregon, and northwestern Nevada cause the region to share many common needs in transportation services. The project is focused on the common needs that could be met by improving regional transportation information exchange and corridor management across jurisdictional boundaries.

Based on applicable ITS architectures, these needs can be organized in four categories: traffic management, traveler information, incident information management, and goods movement. **Table 3.1** outlines the needs and source documents.

Table 3.1: Documented ITS Needs in the Region

Category	ITS Needs	Source
Traffic Management	• Improvement in inter-agency communications • Improved traveler/driver safety under adverse weather conditions	1) California Statewide ITS Architecture – 2004
	• More integration and information sharing between all TOCs throughout Oregon and other centers.	2) Oregon Statewide ITS Architecture – 2006
	• Improve Inter-jurisdictional continuity • Enhance ability to control full range of ITS elements remotely • Improve information exchange between NDOT and the DOTs of adjacent states	3) Northern Nevada ITS Architecture – 2004
	• Provide communications link between agencies to allow exchange of data and video	4) California/Oregon Advanced Transportation Systems (COATS) Regional Architecture – 2000
	• Improve inter-agency coordination • Improve information exchange between Caltrans and neighboring architectures/regions	7) North Valley Regional ITS Architecture – 2005
Traveler Information	• Need for real-time, en-route driver information at strategic, route selection/trip decision points regarding weather/driving conditions, with sufficient notice to make "mid-course corrections" or trip modifications. (Note: types of information include snow, ice, slides, construction Delays and closures) • Need for pre-trip/ pre-departure travel information access for travelers on the state highway system as it traverses across counties.	6) ITS Architecture for Counties of Plumas, Siskiyou, Tehama, Shasta, Lassen, and Trinity – 2006
	• Improved quality and timeliness of information to travelers • Tailored traveler information for truckers	1) California Statewide ITS Architecture – 2004
	• Lack of roadway condition, weather, incident, and maintenance/construction activity information • Travelers need to know when and where inclement weather events impact the transportation network so they can adjust their travel plans accordingly.	2) Oregon Statewide ITS Architecture – 2006

Category	ITS Needs	Source
Traveler Information	• Develop interstate/inter-region traveler information covering a wide area (targeted to CVO)	3) Northern Nevada ITS Architecture – 2004
	• Weather conditions throughout travel area, and the best route to destination are desired	4) California/Oregon Advanced Transportation Systems (COATS) Regional Architecture – 2000
	• Develop interstate / inter-regional traveler information covering a wide area (targeted to Commercial Vehicle Operations (CVO))	7) North Valley Regional ITS Architecture – 2005
Incident Information Management	• Improve incident/emergency response coordination between agencie • Improve communications in mountain and rural areas of the region	3) Northern Nevada ITS Architecture – 2004
	• Provide coordinated planning and operations of incident management between emergency services and traffic management.	5) ITS Strategic Deployment Plan for the Sacramento Region – 2005
	• Improve communications in mountain and rural areas of the region • Better information dissemination regarding diversion of trucks	7) North Valley Regional ITS Architecture – 2005
Goods Movement	• Truckers need more pre-trip and en-route information as to location and open/closed status of roadside rest areas along I-5, road and weather condition information, size and weight restrictions on I-5 feeder routes and local municipalities to which they're destined.	6) ITS Architecture for Counties of Plumas, Siskiyou, Tehama, Shasta, Lassen, and Trinity – 2006
	• Disseminate better CVO information regarding limited alternative routes • Enhance dissemination of road weather information through greater integration with existing capabilities and expansion into new areas such as truck stops	3) Northern Nevada ITS Architecture – 2004
	• Provide coordinated operations between transportation management and freight operations to enhance goods movement through the region	5) ITS Strategic Deployment Plan for the Sacramento Region – 2005

Category	ITS Needs	Source
Goods Movement	• Improve processes for announcing when chain control is in effect in mountains and passes that connect to the region • Develop interstate / inter-regional traveler information covering a wide area (targeted to Commercial Vehicle Operations (CVO)) • Disseminate better information regarding limited alternative routes	7) North Valley Regional ITS Architecture – 2005

Developed by different agencies, at different times, and with different emphases, a similar set of needs for improving regional information emerges, summarized into the following four statements:

1. **Improve communication, data exchange, and coordination among transportation management centers** in different jurisdictions so that each center can obtain real-time information from other centers regarding their traffic/road/weather conditions and the information they disseminate to travelers.
2. **Improve accuracy, timeliness, and completeness of traveler information** including traffic, road conditions, weather, chain control, closures, and incidents. Long distance travelers and heavy vehicle operators should be able to have convenient access to the entire region's traveler information so that they can make informed decisions of itinerary and route selection.
3. **Improve communication of incident response and status information** in mountain and rural areas among jurisdictions so that travelers can receive accurate and timely information such as diversion direction and estimated waiting time.
4. **Improve pre-trip and en-route real-time information tailored for heavy vehicles** regarding the cross-boundary major highway corridors' road conditions, weather, closures, vehicle restrictions, status of truck service facilities, and alternate routes to enhance goods movement efficiency and safety.

Improving communication and data exchange across jurisdictions is the basis for this project to meet these needs.

5. User Services

A series of user services are identified for the *Tri-State Traveler Information Integrated Corridor Management System* to evolve the existing systems to meet the needs of stakeholders. These potential services are expressed as **market packages** defined in the National ITS Architecture shown in **Addendum 3**. The identified user services will be used to guide more detailed project planning.

The services described in the above table will be sufficient to bridge the gaps between existing conditions and stakeholder needs. The user services are part of the applicable regional ITS architectures. Provided services must be consistent with those identified in the applicable regional ITS architecture.

Table 5 summarizes the corresponding services, documented in the applicable regional ITS architectures[1], for each of the potential services offered by the *Tri-State Traveler Information Integrated Corridor Management System* . Every potential service has been identified by at least one of the applicable regional ITS architectures, therefore the *Tri-State Traveler Information Integrated Corridor Management System* is consistent with this portion of the applicable regional ITS architectures.

Table 5 Existing and Expected ITS Services designated by market packages

Market Packages		Existing ITS Services					
		1)*	2)*	3)*	4)*	5)*	6)*
Traffic Management							
ATMS0	Network Surveillance	X	X	X	X	X	X
ATMS0	Freeway Control	X	X	X	X	X	X
ATMS0	Traffic Information Dissemination	X	X	X	X	X	X
ATMS0	Regional Traffic Control	X	X	X	X	X	X
ATMS0	Traffic Incident Management System	X	X		X	X	X
ATMS1	Virtual TMC and Smart Probe Data				X	X	
Traveler Information							
ATIS1	Broadcast Traveler Information	X	X	X	X	X	X
ATIS2	Interactive Traveler Information	X	X	X	X	X	X
Emergency Management							
EM01	Emergency Call-Taking and Dispatch	X	X	X	X	X	X
EM08	Disaster Response and Recovery	X		X		X	X
EM10	Disaster Traveler Information	X		X		X	X

**** Each applicable ITS architecture is represented by a key number:***

1) ***California Statewide ITS Architecture – 2004***
2) ***Oregon Statewide ITS Architecture – 2006***
3) ***Northern Nevada ITS Architecture – 2004***
4) ***California/Oregon Advanced Transportation Systems (COATS) Regional Architecture – 2000***
5) ***ITS Strategic Deployment Plan for the Sacramento Region – 2005***
6) ***North Valley (Counties of Glenn, Butte, and Colusa) Regional ITS Architecture – 2005***

[1] The Market Package section of *The ITS Architecture for Counties of Plumas, Siskiyou, Tehama, Shasta, Lassen, and Trinity – 2007* referenced in previous section has not been completed by the time of this report.

7. CONCEPT OF OPERATIONS OVERVIEW

The optimum implementation strategy for the *Tri-State Traveler Information Integrated Corridor Management System* is to implement the system in three stages:

1. **Short-term information exchange website/portal oriented to coordination between agencies in Caltrans District 2 and southern Oregon.**
2. **Mid-term integration with STARNET to connect to Sacramento TMC, Reno TMC, and other Sacramento regional agencies.**
3. **Long-term integration with California statewide ITS integration projects and share data with more agencies in a wider area.**

In the short-term, the *Tri-State Traveler Information Integrated Corridor Management System* will develop an information exchange website/portal which will be used to exchange information between agencies in Caltrans District 2 and southern Oregon. ODOT Medford TOC, Caltrans District 2 Redding TMC, OSP, CHP and other agencies in this area will be able to connect to the information exchange website/portal and share data automatically and efficiently. The information exchange website/portal can be built within 2-3 years to meet the pressing stakeholder needs of improving rural area center-to-center information exchange and traffic operations coordination across California/Oregon border. In addition, the design of the information exchange website/portal must consider future connectivity and interoperability so that it can be connected to STARTNET and the California statewide ITS integration projects cost-effectively in the following implementation stages.

In the mid-term, the *Tri-State Traveler Information Integrated Corridor Management System* will connect the information exchange website/portal serving Caltrans District 2 and southern Oregon to the STARNET system in Sacramento area to include more agencies and cover a wider geographical area. Reno TMC will need to connect to STARNET to exchange information with Caltrans District 3 Sacramento TMC (which is currently included in STARNET). The connection between the information exchange website/portal and STARNET will provide center-to-center information exchange for northern California, southern Oregon, and northwestern Nevada.

In the long-term, the *Tri-State Traveler Information Integrated Corridor Management System* will participate in California statewide ITS integration projects, which will provide the Tri-State region access to information from other Caltrans Districts. In addition, the *Tri-State Traveler Information Integrated Corridor Management System* will be able to feedback and complement the statewide ITS integration projects by providing data from southern Oregon and northwestern Nevada.

The *Tri-State Traveler Information Integrated Corridor Management System* design will avoid creating temporary solutions that later are difficult to expand or integrate. It is critical to the implementation strategy that the detailed planning and design for every stage must consider the integration and connection in the following steps to save duplicate cost and effort.

The three-stage implementation strategy is illustrated in **Figure 7.1, 7.2** and **7.3**.

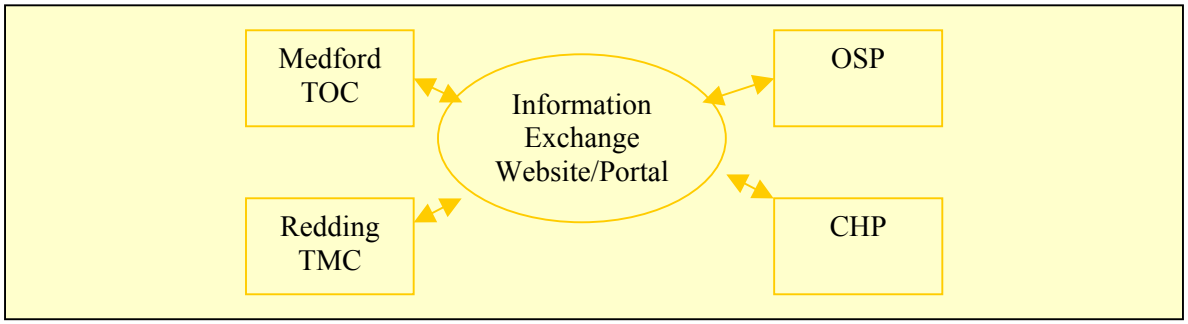


Figure 7.1 Short Term Implementation Stage

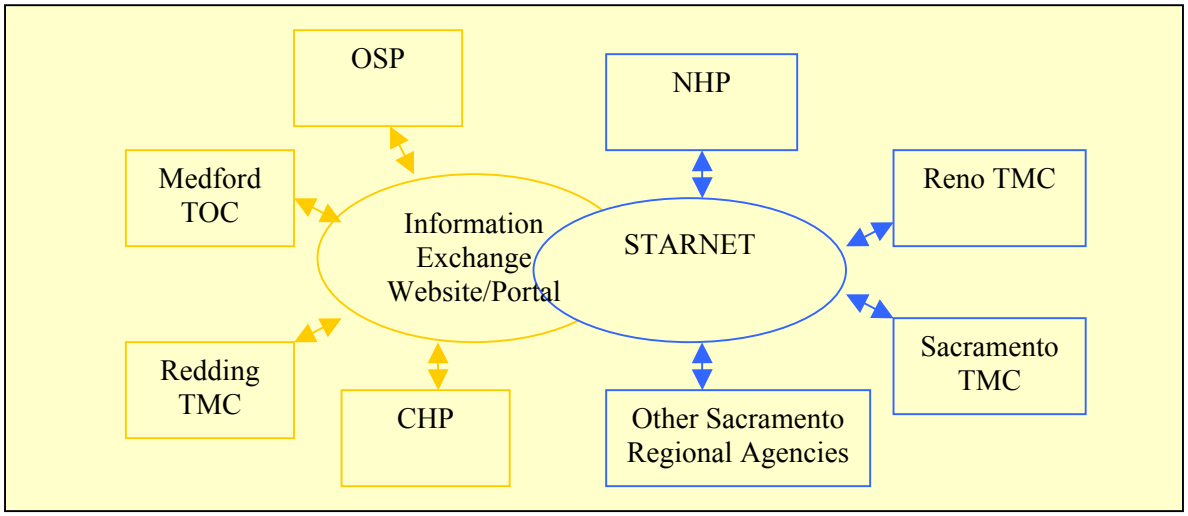


Figure 7.2 Mid Term Implementation Stage

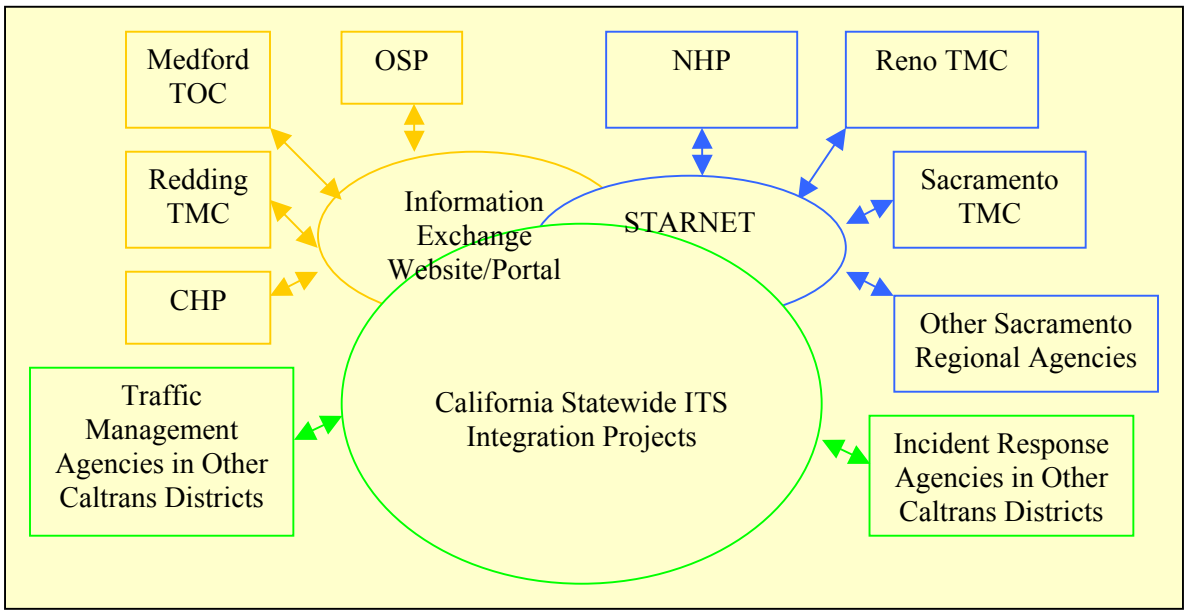


Figure 7.3 Long Term Implementation Stage

8. AGENCY ROLES AND RESPONSIBILITIES

General stakeholder roles and responsibilities were developed to support the interface definitions and interagency agreements that need to be identified in more detailed planning of the Tri-State Traveler Information Integrated Corridor Management System.

The development of the roles and responsibilities up to this point was based on the future the Tri-State Traveler Information Integrated Corridor Management System operation envisioned and verified by the participating stakeholders. Further development of the concept will need the stakeholders and agencies to reach a common understanding of participation in the Tri-State Traveler Information Integrated Corridor Management System.

Instead of replacing the existing operations of each agency, the *Tri-State Traveler Information Integrated Corridor Management System* will be built on the foundation of each agency's existing operations and enhance them. Therefore, the roles and responsibilities documented in the report will not repeat the detailed procedures each agency takes as part of their daily responsibilities, but focus on changes and additions associated with the *Tri-State Traveler Information Integrated Corridor Management System* .

Each stakeholder's general roles and responsibilities in different stages of the implementation and operation of the *Tri-State Traveler Information Integrated Corridor Management System* are defined in the context of four ITS services and summarized in Figure 8.1:

- Traffic Management
- Traveler Information
- Incident Information Management
- Goods Movement

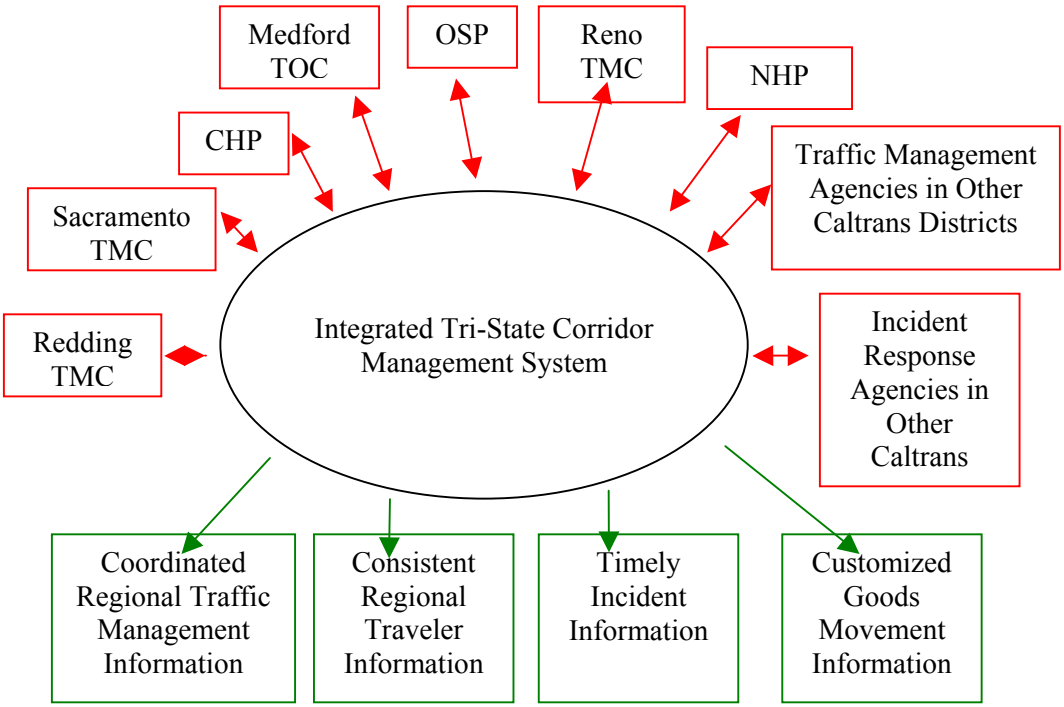


Figure 8.1: General Concept of Data Connection for the *Tri-State Traveler Information Integrated Corridor Management System*

Table 8.1 summarizes the roles and responsibilities of each stakeholder from a high-level, **Table 8.2a and 8.2b** document the detailed roles and responsibilities associated with the *Tri-State Traveler Information Integrated Corridor Management System* in different implementation stages.

Table 8.1 Roles and Responsibilities Summary

General Services	Transportation Management Centers ▪ Redding TMC ▪ Sacramento TMC ▪ Medford TOC ▪ Reno TMC	Emergency Response Agencies ▪ CHP ▪ OSP ▪ NHP	Planning Agencies ▪ Caltrans HQ ▪ FHWA	Goods Movement Related Organizations ▪ Trucking Industry
Traffic Management				
Provide real-time traffic and road condition data to the *Tri-State Traveler Information Integrated Corridor Management System*	X			
Ensure quality of the data provided and maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System*	X			
Use the regional traffic data retrieved from the *Tri-State Traveler Information Integrated Corridor Management System* to coordinate traffic management with other centers	X			
Traveler Information				
Provide comprehensive regional traveler information through DMS, HAR, internet, and phone services with assistance of the regional information retrieved from the *Tri-State Traveler Information Integrated Corridor Management System*	X			

General Services	Transportation Management Centers ▪ Redding TMC ▪ Sacramento TMC ▪ Medford TOC ▪ Reno TMC	Emergency Response Agencies ▪ CHP ▪ OSP ▪ NHP	Planning Agencies ▪ Caltrans HQ ▪ FHWA	Goods Movement Related Organizations ▪ Trucking Industry
Incident Information Management				
Provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System*		X		
Provide real-time road maintenance/closure information to the *Tri-State Traveler Information Integrated Corridor Management System*	X			
Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response		X		
Retrieve real-time incident response status and disseminate to travelers	X			
Goods Movement				
Retrieve regional traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks	X			
Coordinate with public agencies by provided required truck operation data to enhance goods movement efficiency and safety	X		X	X
Identify detailed truck data needs and analyze the data feedback by trucks to improve management			X	X

Table 8.2a Detailed Roles and Responsibilities

Agency	Roles/Responsibilities	Implementation Stage
Traffic Management		
Caltrans District 2 Redding TMC	• Serve as the champion of the *Tri-State Traveler Information Integrated Corridor Management System* , lead the implementation, and coordinate funding for the system's design, implementation, operation and maintenance • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in District 2 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	• Serve as the champion of the *Tri-State Traveler Information Integrated Corridor Management System* , lead the integration with STARNET, and coordinate funding for the system's design, implementation, operation and maintenance • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in District 2 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	• Serve as the champion of the *Tri-State Traveler Information Integrated Corridor Management System* , lead the integration with statewide ITS integration projects, and coordinate funding for the system's design, implementation, operation and maintenance • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in District 2 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term

Agency	Roles/Responsibilities	Implementation Stage
ODOT Medford TOC	• Coordinate with Redding TMC in the design, implementation, operation and maintenance of the *Tri-State Traveler Information Integrated Corridor Management System* • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in southern Oregon and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	• Coordinate with Redding TMC in the integration with STARNET • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in southern Oregon and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	• Coordinate with Redding TMC in the integration with statewide ITS integration projects • Maintain physical connection to the and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in southern Oregon and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
Caltrans District 3 Sacramento TMC	• Maintain its current plan of participation in STARNET program	Short-Term
	• Coordinate with Redding TMC in the integration of STARNET in the *Tri-State Traveler Information Integrated Corridor Management System* • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in Caltrans District 3 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term

Agency	Roles/Responsibilities	Implementation Stage
	• Coordinate with Redding TMC in the integration with statewide ITS integration projects • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in Caltrans District 3 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
NDOT Reno TMC	• **Establish automated data exchange with Sacramento TMC by participating in STARNET**	**Short-Term**
	• **Coordinate with Redding TMC in the integration of STARNET in the *Tri-State Traveler Information Integrated Corridor Management System*** • **Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System*** • **Collect real-time traffic and roadway information in northwestern Nevada and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System***	**Mid-Term**
	• Coordinate with Redding TMC in the integration with statewide ITS integration projects • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in Caltrans District 3 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
Traveler Information		

Agency	Roles/Responsibilities	Implementation Stage
Caltrans District 2 Redding TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 2 traveler information website, HAR, and DMS. • Provide the message disseminated to travelers in District 2 to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	• Receive real-time traffic and roadway information and traveler information of southern Oregon, northwestern Nevada, and Caltrans District 3 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 2 traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in District 2 to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	• Receive real-time traffic and roadway information and traveler information of southern Oregon, northwestern Nevada, and other Caltrans Districts from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 2 traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in District 2 to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
ODOT Medford TOC	• Receive real-time traffic and roadway information and traveler information of northern California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	• Receive real-time traffic and roadway information and traveler information of northwestern Nevada, Caltrans District 2, and District 3 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide the message disseminated to travelers in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term

Agency	Roles/Responsibilities	Implementation Stage
	• Receive real-time traffic and roadway information and traveler information of northwestern Nevada and entire California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
Caltrans District 3 Sacramento TMC	• Maintain its current plan of exchanging information with Sacramento regional agencies using STARNET	Short-Term
	• Receive real-time traffic and roadway information and traveler information of southern Oregon, northwestern Nevada, and Caltrans District 2 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 3 traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	• Receive real-time traffic and roadway information and traveler information of northwestern Nevada and entire California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
NDOT Reno TMC	• **Establish automated traveler information coordination with Sacramento TMC by participating in STARNET**	**Short-Term**
	• **Receive real-time traffic and roadway information and traveler information of southern Oregon, Caltrans District 2, and Caltrans District 3 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Nevada traveler information website, HAR, and DMS.** • **Provide messages disseminated to travelers in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System***	**Mid-Term**

Agency	Roles/Responsibilities	Implementation Stage
	• **Receive real-time traffic and roadway information and traveler information of southern Oregon and entire California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Nevada traveler information website, HAR, and DMS.** • **Provide the message disseminated to travelers in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System***	**Long-Term**

Incident Information Management		
Caltrans District 2 Redding TMC	• Provide real-time road maintenance and closure information in Caltrans District 2 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Short-Term
	• Provide real-time road maintenance and closure information in Caltrans District 2 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, northwestern Nevada, and Caltrans District 3 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Mid-Term
	• Provide real-time road maintenance and closure information in Caltrans District 2 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, northwestern Nevada, and other Caltrans Districts road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term
ODOT Medford TOC	• Provide real-time road maintenance and closure information in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve Caltrans District 2 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Short-Term

	• Provide real-time road maintenance and closure information in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve northwestern Nevada, Caltrans District 2, and District 3 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Mid-Term
	• Provide real-time road maintenance and closure information in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve northwestern Nevada and entire California road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term
Caltrans District 3 Sacramento TMC	• Maintain its current plan of exchanging incident information with Sacramento regional agencies using STARNET	Short-Term
	• Provide real-time road maintenance and closure information in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, northwestern Nevada, and Caltrans District 2 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Mid-Term
	• Provide real-time road maintenance and closure information in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve northwestern Nevada, southern Oregon and other Caltrans Districts road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term
NDOT Reno TMC	• **Establish automated incident information exchange with Sacramento TMC by participating in STARNET**	**Short-Term**
	• **Provide real-time road maintenance and closure information in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* the information** • **Retrieve southern Oregon, Caltrans District 2, and District 3 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers**	**Mid-Term**

	• **Provide real-time road maintenance and closure information in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* the information** • **Retrieve southern Oregon and entire California road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers**	**Long-Term**
CHP	• Respond to incident in California and provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Short-Term
	• Respond to incident in California and provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Mid-Term
	• Respond to incident in California and provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System* and TMCAL • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Long-Term
OSP	• Respond to incident in Oregon and provide real-time incident response status within southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Short-Term
	• Respond to incident in Oregon and provide real-time incident response status within southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Mid-Term
	• Respond to incident in Oregon and provide real-time incident response status within southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Long-Term

NHP	• **Respond to incident in Nevada and provide real-time incident response status of northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System*** • **Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response**	**Short-Term**
	• **Respond to incident in Nevada and provide real-time incident response status within northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System*** • **Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response**	**Mid-Term**
	• **Respond to incident in Nevada and provide real-time incident response status within northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System*** • **Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response**	**Long-Term**
Goods Movement		
Caltrans District 2 Redding TMC	• Retrieve Caltrans District 2 and southern Oregon traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 2	Short-Term
	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 2	Mid-Term
	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 2	Long-Term
ODOT Medford TOC	• Retrieve Caltrans District 2 and southern Oregon traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within southern Oregon	Short-Term

	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within southern Oregon	Mid-Term
	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within southern Oregon	Long-Term
Caltrans District 3 Sacramento TMC	• Continue its currently goods movement oriented service and coordination with NDOT	Short-Term
	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 3	Mid-Term
	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 3	Long-Term
NDOT Reno TMC	• **Continue its currently goods movement oriented service and coordination with Caltrans District 3**	**Short-Term**
	• **Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within northwest Nevada**	**Mid-Term**
	• **Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within northwestern Nevada**	**Long-Term**
Caltrans Headquarters / FHWA	• Coordinate with regional agencies and trucking industry to identify detailed goods movement data needs • Ensure consistency among all truck management programs	Short-Term
	• Assist the system's connection to STARNET	Mid-Term
	• Assist the system's connection to statewide ITS projects	Long-Term
Goods-Movement-related	• Coordinate with public agencies to identify detailed goods movement data needs • Provide feedback on existing and planned truck management programs	Short-Term

organizations	• Continue providing needs and feeding back information for expanded the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	• Continue providing needs and feeding back information for the statewide ITS integration projects	Long-Term

Table 8.2b Detailed Roles and Responsibilities Sorted by Term (Implementation Stage)

	Agency	Roles/Responsibilities	Implementation Stage
Traffic Management			
	ODOT Medford TOC	• Coordinate with Redding TMC in the design, implementation, operation and maintenance of the *Tri-State Traveler Information Integrated Corridor Management System* • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in southern Oregon and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	Caltrans District 2 Redding TMC	• Serve as the champion of the *Tri-State Traveler Information Integrated Corridor Management System* , lead the implementation, and coordinate funding for the system's design, implementation, operation and maintenance • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in District 2 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	Caltrans District 3 Sacramento TMC	• Maintain its current plan of participation in STARNET program	Short-Term
	NDOT Reno TMC	• Establish automated data exchange with Sacramento TMC by participating in STARNET	Short-Term
	Caltrans District 2 Redding TMC	• Serve as the champion of the *Tri-State Traveler Information Integrated Corridor Management System* , lead the integration with STARNET, and coordinate funding for the system's design, implementation, operation and maintenance • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in District 2 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term

	Agency	Roles/Responsibilities	Implementation Stage
	Caltrans District 3 Sacramento TMC	• Coordinate with Redding TMC in the integration of STARNET in the *Tri-State Traveler Information Integrated Corridor Management System* • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in Caltrans District 3 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	NDOT Reno TMC	• Coordinate with Redding TMC in the integration of STARNET in the *Tri-State Traveler Information Integrated Corridor Management System* • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in northwestern Nevada and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	ODOT Medford TOC	• Coordinate with Redding TMC in the integration with STARNET • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in southern Oregon and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term

	Agency	Roles/Responsibilities	Implementation Stage
	Caltrans District 2 Redding TMC	• Serve as the champion of the *Tri-State Traveler Information Integrated Corridor Management System* , lead the integration with statewide ITS integration projects, and coordinate funding for the system's design, implementation, operation and maintenance • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in District 2 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
	ODOT Medford TOC	• Coordinate with Redding TMC in the integration with statewide ITS integration projects • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in southern Oregon and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
	Caltrans District 3 Sacramento TMC	• Coordinate with Redding TMC in the integration with statewide ITS integration projects • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in Caltrans District 3 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
	TMC	• Coordinate with Redding TMC in the integration with statewide ITS integration projects • Maintain physical connection to the *Tri-State Traveler Information Integrated Corridor Management System* and ensure quality of data provided to the *Tri-State Traveler Information Integrated Corridor Management System* • Collect real-time traffic and roadway information in Caltrans District 3 and provide the information to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term

	Agency	Roles/Responsibilities	Implementation Stage
Traveler Information			
	Caltrans District 2 Redding TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 2 traveler information website, HAR, and DMS. • Provide the message disseminated to travelers in District 2 to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	ODOT Medford TOC	• Receive real-time traffic and roadway information and traveler information of northern California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System*	Short-Term
	Caltrans District 3 Sacramento TMC	• Maintain its current plan of exchanging information with Sacramento regional agencies using STARNET	Short-Term
	NDOT Reno TMC	• Establish automated traveler information coordination with Sacramento TMC by participating in STARNET	Short-Term
	Caltrans District 2 Redding TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon, northwestern Nevada, and Caltrans District 3 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 2 traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in District 2 to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term

	Agency	Roles/Responsibilities	Implementation Stage
	ODOT Medford TOC	• Receive real-time traffic and roadway information and traveler information of northwestern Nevada, Caltrans District 2, and District 3 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide the message disseminated to travelers in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	Caltrans District 3 Sacramento TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon, northwestern Nevada, and Caltrans District 2 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 3 traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	NDOT Reno TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon, Caltrans District 2, and Caltrans District 3 from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Nevada traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
	District 2 Redding TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon, northwestern Nevada, and other Caltrans Districts from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on District 2 traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in District 2 to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term

	Agency	Roles/Responsibilities	Implementation Stage
	ODOT Medford TOC	• Receive real-time traffic and roadway information and traveler information of northwestern Nevada and entire California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
	Caltrans District 3 Sacramento TMC	• Receive real-time traffic and roadway information and traveler information of northwestern Nevada and entire California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Oregon traveler information website, HAR, and DMS. • Provide messages disseminated to travelers in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term
	TMC	• Receive real-time traffic and roadway information and traveler information of southern Oregon and entire California from the *Tri-State Traveler Information Integrated Corridor Management System* , produce consistent and comprehensive regional traveler information, and provide it on Nevada traveler information website, HAR, and DMS. • Provide the message disseminated to travelers in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System*	Long-Term

	Agency	Roles/Responsibilities	Implementation Stage
Incident Information Management			
	Caltrans District 2 Redding TMC	• Provide real-time road maintenance and closure information in Caltrans District 2 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Short-Term

Agency	Roles/Responsibilities	Implementation Stage
ODOT Medford TOC	• Provide real-time road maintenance and closure information in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve Caltrans District 2 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Short-Term
Caltrans District 3 Sacramento TMC	• Maintain its current plan of exchanging incident information with Sacramento regional agencies using STARNET	Short-Term
NDOT Reno TMC	• **Establish automated incident information exchange with Sacramento TMC by participating in STARNET**	**Short-Term**
CHP	• Respond to incident in California and provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Short-Term
OSP	• Respond to incident in Oregon and provide real-time incident response status within southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Short-Term
NHP	• Respond to incident in Nevada and provide real-time incident response status of northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Short-Term
Caltrans District 2 Redding TMC	• Provide real-time road maintenance and closure information in Caltrans District 2 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, northwestern Nevada, and Caltrans District 3 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Mid-Term

Agency	Roles/Responsibilities	Implementation Stage
ODOT Medford TOC	• Provide real-time road maintenance and closure information in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve northwestern Nevada, Caltrans District 2, and District 3 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to traveler	Mid-Term
Caltrans District 3 Sacramento TMC	• Provide real-time road maintenance and closure information in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, northwestern Nevada, and Caltrans District 2 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Mid-Term
NDOT Reno TMC	• Provide real-time road maintenance and closure information in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, Caltrans District 2, and District 3 road maintenance/closure information and regional incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Mid-Term
CHP	• Respond to incident in California and provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Mid-Term
OSP	• Respond to incident in Oregon and provide real-time incident response status within southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Mid-Term

Agency	Roles/Responsibilities	Implementation Stage
NHP	• Respond to incident in Nevada and provide real-time incident response status within northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Mid-Term
Caltrans District 2 Redding TMC	• Provide real-time road maintenance and closure information in Caltrans District 2 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon, northwestern Nevada, and other Caltrans Districts road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term
ODOT Medford TOC	• Provide real-time road maintenance and closure information in southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve northwestern Nevada and entire California road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term
Caltrans District 3 Sacramento TMC	• Provide real-time road maintenance and closure information in Caltrans District 3 to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve northwestern Nevada, southern Oregon and other Caltrans Districts road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term
NDOT Reno TMC	• Provide real-time road maintenance and closure information in northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* the information • Retrieve southern Oregon and entire California road maintenance/closure information and incident response status from the *Tri-State Traveler Information Integrated Corridor Management System* and disseminate to travelers	Long-Term

Agency	Roles/Responsibilities	Implementation Stage
CHP	• Respond to incident in California and provide real-time incident response status to the *Tri-State Traveler Information Integrated Corridor Management System* and TMCAL • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Long-Term
OSP	• Respond to incident in Oregon and provide real-time incident response status within southern Oregon to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Long-Term
	• Respond to incident in Nevada and provide real-time incident response status within northwestern Nevada to the *Tri-State Traveler Information Integrated Corridor Management System* • Retrieve regional real-time traffic/road information from the *Tri-State Traveler Information Integrated Corridor Management System* to facilitate incident response	Long-Term

Agency	Roles/Responsibilities	Implementation Stage
Goods Movement		
Caltrans District 2 Redding TMC	• Retrieve Caltrans District 2 and southern Oregon traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 2	Short-Term
ODOT Medford TOC	• Retrieve Caltrans District 2 and southern Oregon traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within southern Oregon	Short-Term
Caltrans District 3 Sacramento TMC	• Continue its currently goods movement oriented service and coordination with NDOT	Short-Term
NDOT Reno TMC	• Continue its currently goods movement oriented service and coordination with Caltrans District 3	Short-Term
Caltrans Headquarters / FHWA	• Coordinate with regional agencies and trucking industry to identify detailed goods movement data needs • Ensure consistency among all truck management programs	Short-Term

Agency	Roles/Responsibilities	Implementation Stage
Goods-Movement-related organizations	• Coordinate with public agencies to identify detailed goods movement data needs • Provide feedback on existing and planned truck management programs	Short-Term
Caltrans District 2 Redding TMC	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 2	Mid-Term
ODOT Medford TOC	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within southern Oregon	Mid-Term
Caltrans District 3 Sacramento TMC	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 3	Mid-Term
NDOT Reno TMC	• Retrieve the Tri-State region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within northwest Nevada	Mid-Term
Caltrans Headquarters / FHWA	• Assist the system's connection to STARNET	Mid-Term
Goods-Movement-related organizations	• Continue providing needs and feeding back information for expanded the *Tri-State Traveler Information Integrated Corridor Management System*	Mid-Term
District 2 Redding TMC	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 2	Long-Term
ODOT Medford TOC	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within southern Oregon	Long-Term

Agency	Roles/Responsibilities	Implementation Stage
Caltrans District 3 Sacramento TMC	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within District 3	Long-Term
TMC	• Retrieve the California statewide, southern Oregon, and northwest Nevada region traffic, roadway, and incident information from the *Tri-State Traveler Information Integrated Corridor Management System* and produce tailored information to trucks within northwestern Nevada	Long-Term
Caltrans Headquarters / FHWA	• Assist the system's connection to statewide ITS projects	Long-Term
Goods-Movement-related organizations	• Continue providing needs and feeding back information for the statewide ITS integration projects	Long-Term

9. DATA EXCHANGE SCHEME AND HIGH-LEVEL FUNCTIONAL REQUIREMENTS

The stakeholder agencies will interact in different ways to produce, communicate, and disseminate data in different stages of the *Tri-State Traveler Information Integrated Corridor Management System* implementation. The data exchange schemes for the three implementation stages are summarized and illustrated in **Figure 9.1**, **Figure 9.2**, and **Figure 9.3**. The detailed explanations for each figure are followed.

9.1 Short-Term Data Exchange Scheme

In the short-term implementation stage, the key players are the Caltrans District 2 Redding TMC and ODOT Medford TOC. The two agencies will not only maintain their regular operations (including monitor road/weather conditions with ITS field devices) but will also share data through the *Tri-State Traveler Information Integrated Corridor Management System* with each other. The data feedback from the *Tri-State Traveler Information Integrated Corridor Management System* will be more comprehensive and cover more than the agencies' own jurisdictions. Similarly, CHP and OSP will use the *Tri-State Traveler Information Integrated Corridor Management System* to share real-time incident response status with the traffic management agencies. In addition, the *Tri-State Traveler Information Integrated Corridor Management System* will be able to directly feed comprehensive and timely information to traveler information dissemination media, such as a regional traveler information website or regional traveler information phone service. The detailed information exchange scheme for the short-term the *Tri-State Traveler Information Integrated Corridor Management System* implementation is illustrated in **Figure 9.1**.

9.2 Mid-Term Data Exchange Scheme

In the mid-term implementation stage, the primary goal for the *Tri-State Traveler Information Integrated Corridor Management System* is to have Caltrans District 3 and northwestern Nevada join the data exchange. By this stage, STARNET will be implemented within the Sacramento region for several initial agencies, including Caltrans District 3 Sacramento TMC, to exchange data. NDOT Reno TMC will connect to STARNET and exchange data with Caltrans District 3. The *Tri-State Traveler Information Integrated Corridor Management System* will then connect to STARNET and have agencies in Caltrans District 2, Caltrans District 3, southern Oregon, and northwestern Nevada to share their traffic management data and incident response status. Travelers in the Tri-State region will have comprehensive and real-time traveler information fed directly from the *Tri-State Traveler Information Integrated Corridor Management System* to a traveler information website or regional traveler information phone services. The detailed information exchange scheme for the mid-term the *Tri-State Traveler Information Integrated Corridor Management System* implementation is illustrated in **Figure 9.2**.

9.3 Long-Term Data Exchange Scheme

Upon the implementation of the statewide ITS integration projects in California, the *Tri-State Traveler Information Integrated Corridor Management System* will join these project and share traffic management data and incident response status. The *Tri-State Traveler Information Integrated Corridor Management System* will provide data from the Tri-State region, and obtain data from all Caltrans Districts. Traveler information from California statewide, southern

Oregon and northwestern Nevada will be available to the public through TIMI or Statewide 511 System. The detailed information exchange scheme for the long-term the *Tri-State Traveler Information Integrated Corridor Management System* implementation is illustrated in **Figure 9.3**.

Figure 9.1: Short-Term Data Exchange

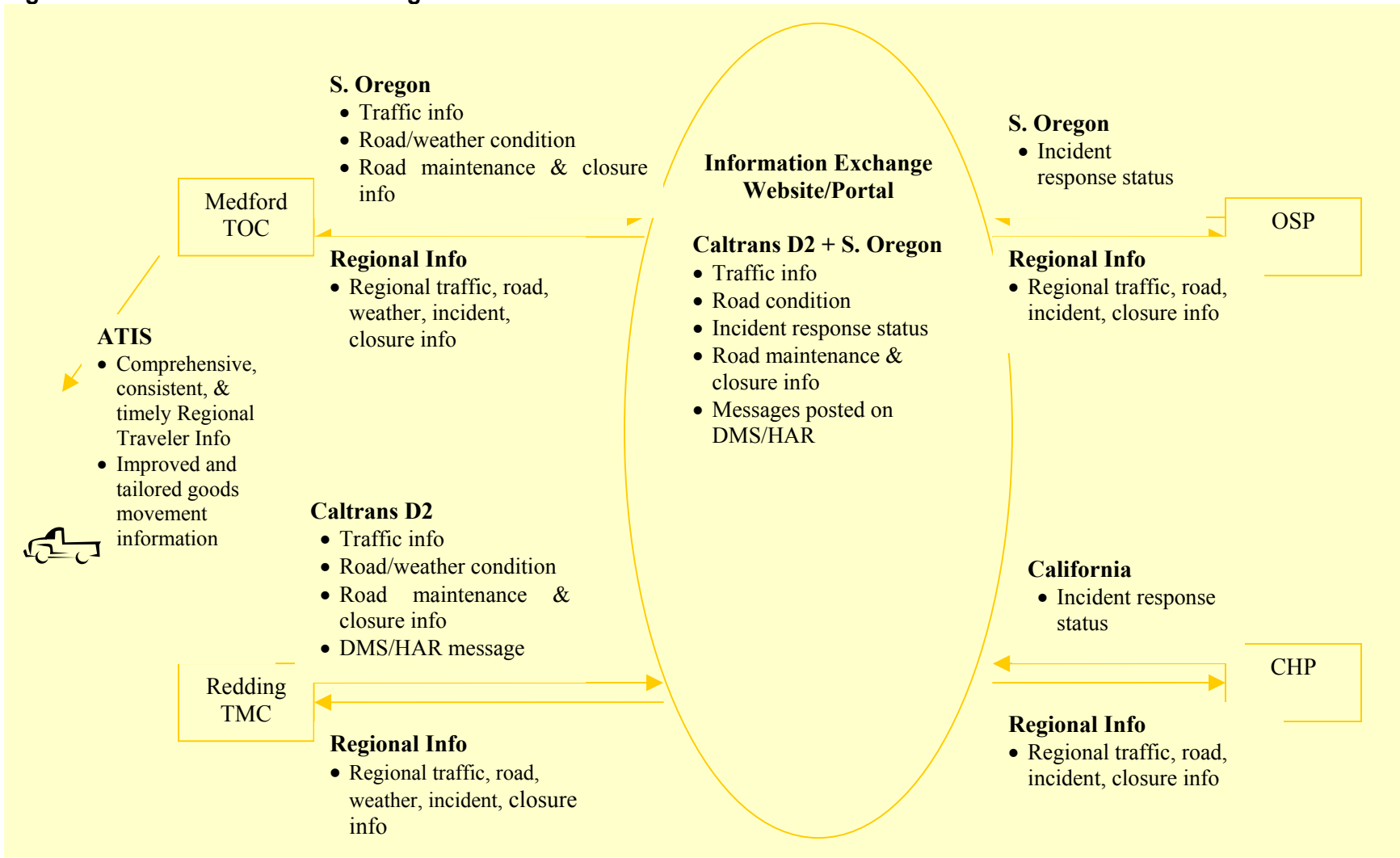


Figure 9.2: Mid-Term Connection to STARNET

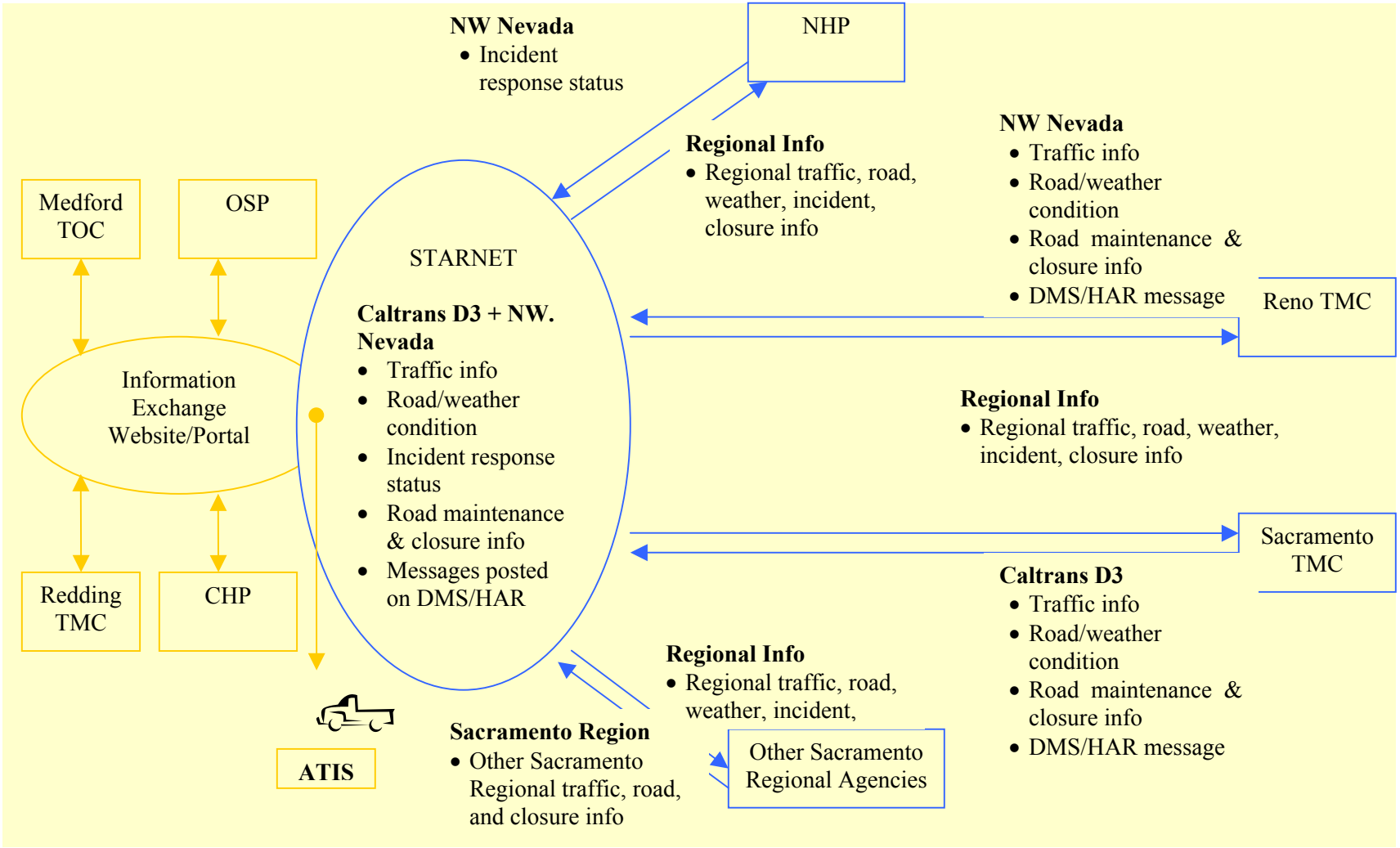
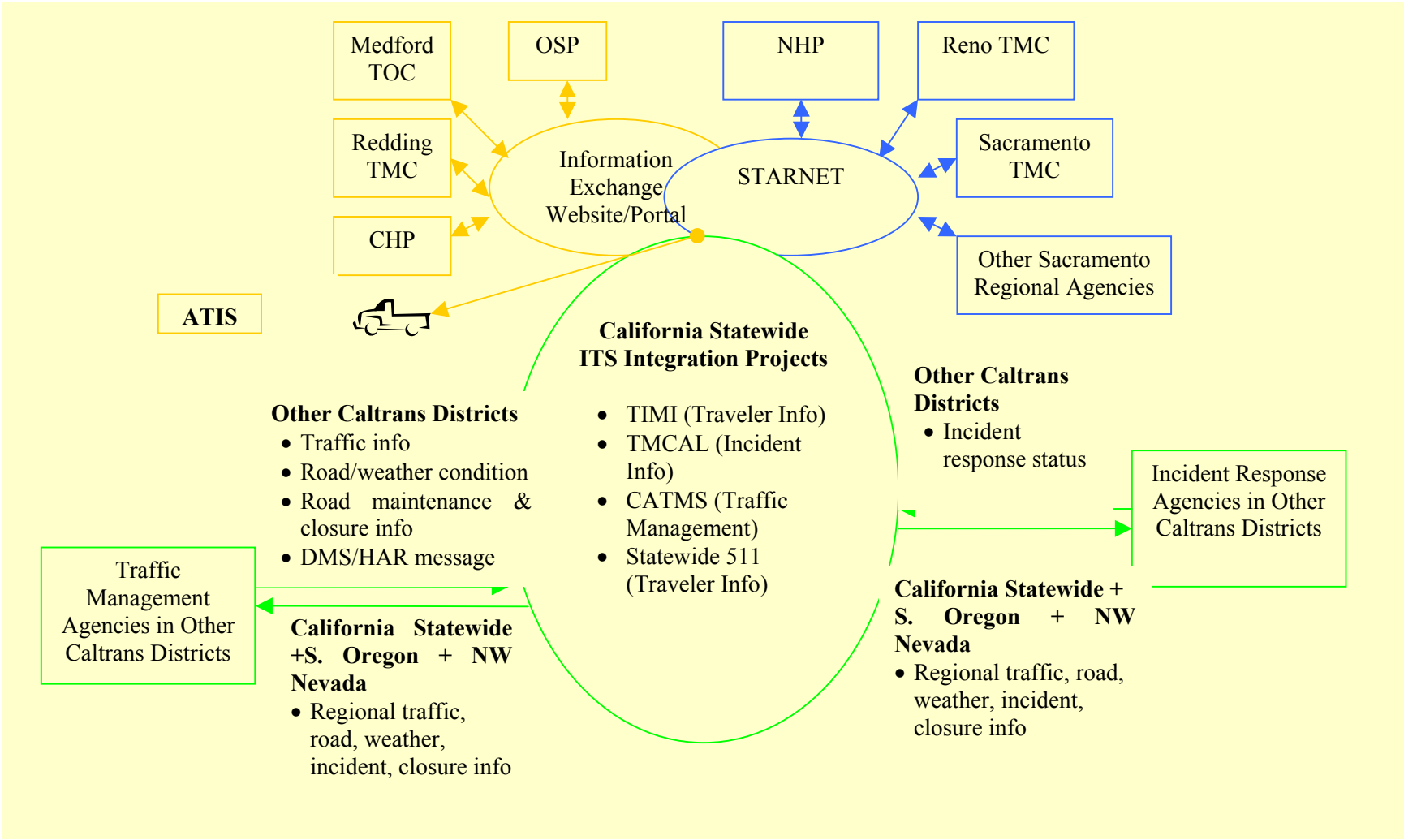


Figure 9.3: Long-Term Connection to Statewide ITS Projects



10. CONCLUSION

10.1 Rural ITS Capabilities and Funding Constraints

The *Tri-State Traveler Information Integrated Corridor Management System* plan has identified several priority ITS services to expand the traffic management capabilities within the rural corridor area to enhance safety, improve inter-agency communications and coordination, and to provide valuable information to travelers. As we lay out the blueprint to develop the *Tri-State Traveler Information Integrated Corridor Management System* , the project team has identified that a significant constraint to meeting stakeholder needs is a general funding shortage for rural ITS, which has and will continue to impede California's mobility improvement if not addressed.

Traditionally, a significant percentage of ITS project and operations funding has been dedicated to the urban areas, where applications and systems are deployed to primarily address congestion management. The rural areas, however, demonstrate unique challenges related to safety and mobility. In the case of the *Tri-State Traveler Information Integrated Corridor Management System* this will require a concerted effort among the three DOT partner agencies to prioritize funding needs within their agency programming and project development processes with the *Tri-State Traveler Information Integrated Corridor Management System* in mind.

Funding for rural ITS programs has been a challenge for California, as well as for other states. These challenges persist despite the fact that even incremental enhancements – such as strategically placed dynamic message signs, establishing communications connections between agencies, or broadening road/weather detection capabilities – can have a significant impact to the overall safety and mobility of the corridor.

Priority areas for the *Tri-State Traveler Information Integrated Corridor Management System* focus heavily on enhancing the communications infrastructure and interagency communications capabilities among the DOT and public safety agencies within the corridor. Priority should be given to these activities, and project champions should seek creative uses of funds to accelerate these efforts. The USDOT also views rural communications as an important issue, and recognizes that it is a key enabler to several rural operational enhancements. In fact, SAFETEA-LU identified a *Rural Interstate Corridor Communications Study*[2] as one of its key directives. Although California was not named among the priority corridors for the initial round of funding, there could potentially be future opportunities through the USDOT to fund rural communications and connectivity enhancements. This may require involving stakeholders at the legislative level to be able to take California and the Tri-State partners issues to the federal level to justify the need for funding resources. Effective movement of freight – critical to California's economy as well as that of the United States – is very dependent on agencies within this corridor having the tools, resources and systems to promote better management, safety, maintenance and operations.

The reality is that partners will most likely need to identify ways to integrate the Tri-State priorities within their respective planning and programming efforts.

[2] http://www.itsa.org/safetealu_titlefive.html Section 5507 - *Rural Interstate Corridor Communications Study*; Project to determine the feasibility of installing fiber optic cable and wireless communication infrastructure along rural interstate corridors. Funding of $1 million in 2006 and $2 million in 2007 is available.

Key steps recommended for the partnership include:

- Reviewing their respective ITS architectures to be sure that rural ITS components are adequately addressed. Federal funds for rural ITS projects are subject to the same architecture conformity requirements as urban area projects
- Prioritize rural ITS projects that support the key goals and focus areas identified in the Management System plan – these include incident management, traveler information and agency connectivity
- Continue to collectively identify implementation and integration priorities for the *Tri-State Traveler Information Integrated Corridor Management System* , and look at the potential of a pooled-fund approach among the three DOTs to implement larger scale integration efforts
- Seek out innovative partnerships to help build the infrastructure to support rural ITS management, operations, weather detection, and information sharing. This could be an opportunity to partner with other public agencies or the private sector to be able to leverage investments in infrastructure, and provide greater flexibility for limited rural ITS funding dollars.

10.2 Next Steps

The high-level planning for the *Tri-State Traveler Information Integrated Corridor Management System* has included an existing system inventory, needs identification, gap analysis, project concept analysis, concept of operations identification, and high-level functional requirements as a bridge to the detailed functional requirements development.

The next steps to implement the first stage of the *Tri-State Traveler Information Integrated Corridor Management System* include:

1. Make project financial plan and identify funding opportunities – As discussed above, funding for rural ITS must be identified for the implementation, operation and maintenance of the *Tri-State Traveler Information Integrated Corridor Management System* before the stakeholders take the next steps.

2. Project development team formation and confirmation of project champion for the following implementation stages – Caltrans District 2 has agreed to assume the role of project champion for the first implementation stage of the *Tri-State Traveler Information Integrated Corridor Management System* . Project champion for the following stages of implantation will need to be identified

3. Develop detailed functional requirements for each implementation stage – After funding sources are secured and project champion is identified for each stage of implementation, the *Tri-State Traveler Information Integrated Corridor Management System* will need to develop more detailed functional requirements to guide the design and integration of software and hardware in the system.

4. Other necessary steps toward the goal of securing project implementation funds, such as developing project Systems Engineering Management Plan (SEMP), project Feasibility Study Report (FSR), or other document that is necessary to secure project implementation funding.

Addendum 1: Counties and Major Cities in the Project Region

	Counties	Major Cities
Caltrans District 2	• Lassen • Modoc • Plumas • Shasta • Siskiyou • Tehama • Trinity	• Redding • Yreka • Red Bluff • Susanville • Alturas
Caltrans District 3	• Butte • Colusa • El Dorado • Glenn • Nevada • Placer • Sacramento • Sierra • Sutter • Yolo • Yuba	• Sacramento • Marysville • Auburn • Colusa • Yuba City • Lake Tahoe • Willows • Nevada City • Woodland
ODOT District 11	• Jackson • Klamath • Lake • Harney • Malheur	• Medford • Klamath Falls • Lakeview
NDOT District 2	• Douglas • Lyon • Washoe • Storey	• Reno • Carson City

Addendum 2: Primary Regional Stakeholders

Agency	Division
Nevada DOT	**Maintenance and Operations Division, ITS Operations Section**
Nevada Highway Patrol (NHP)	**Northern Command**
Oregon DOT	Intelligent Transportation Systems (ITS)
Oregon State Police (OSP)	Patrol Services
California Highway Patrol (CHP)	Northern Division
Caltrans District 2	Planning & Local Assistance / Traffic Operations
Caltrans District 3	Planning & Local Assistance / Traffic Operations
Caltrans Headquarters	Transportation Planning Division, Division of Research and Innovation, Division of Operations, Division of Admin & Information Technology
Counties and Cities in the region	Transportation Planning or Public Works Departments
Local emergency response agencies	Local police and fire departments
FHWA	FHWA California, Nevada, & Oregon State Offices
Goods-Movement-related organizations	West Coast Corridor Coalition, California Trucking Association

Addendum 3: Tri-State TI Corridor Management System Services

Market Packages		Brief Definition by National ITS Architecture
Traffic Management		
ATMS01	Network Surveillance	Traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to traffic management.
ATMS04	Freeway Control	Provides central monitoring and control, communications, and field equipment that support freeway management. It also includes the capability to utilize surveillance information for detection of incidents.
ATMS06	Traffic Information Dissemination	Provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, incident information, and emergency alerts and driver advisories.
ATMS07	Regional Traffic Control	Provides for the sharing of traffic information and control among traffic management centers to support a regional control strategy.
ATMS08	Traffic Incident Management System	Manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized.
ATMS12	Virtual TMC and Smart Probe Data	Provides for special requirements of rural road systems. Instead of a central TMC, the traffic management is distributed over a very wide area (e.g., a whole state or collection of states). Each locality has the capability of accessing available information for assessment of road conditions.
Traveler Information		
ATIS1	Broadcast Traveler Information	Collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures and low cost user equipment.
ATIS2	Interactive Traveler Information	Provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information.

Emergency Management		
EM01	Emergency Call-Taking and Dispatch	Provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency.
EM08	Disaster Response and Recovery	Enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters and technological and man-made disasters.
EM10	Disaster Traveler Information	Uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster.